NRCS Golden Meadow Plant Materials Center 2004 Progress Report of Activities

United States Department of Agriculture

Natural Resources Conservation Service

Golden Meadow Plant Materials Center

Galliano Louisiana

PMC Staff

Gary Fine, Manager
gary.fine@la.usda.gov

Garret Thomassie,
Soil Conservationist

Mark Felarise
Biological Science Technician

Elizabeth Sharratt
Biological Science Technician

Alexis Luke
Office Automation Assistant

Chera Kee Trosclair
Biological Science Aid

Dawn Bagala
Biological Science Aid

Scott Edwards,
Plant Materials Specialist
Alexandria, LA

The USDA, Natural Recourse Conservation Service Golden Meadow Plant Materials Center (PMC) in Galliano Louisiana has been a leader in coastal wetland plant restoration and technology development. Currently, Louisiana loses 25 to 35 square miles of marsh a year or an acre every 25 minutes. This accounts for 90% of the nation's annual coastal wetland loss. Coastal wetland remediation, restoration, and enhancement with vegetation released by the Golden Meadow PMC has proven effective in reducing the conversion of marsh to open water, reducing soil erosion, and promoting re-establishment of emergent vegetation.

The Golden Meadow PMC is located within the Barataria-Terrebonne Estuary, which is the largest and most productive estuarine system in the United States. This is essentially a living laboratory from which to study and advance coastal wetland plant technology.

The Golden Meadow PMC selects conservation plants and develops innovative planting technology to solve the nation's most important resource concerns. Our mission is to develop, test, and transfer effective state-of-the art plant science technology to meet customer and resource needs.

Golden Meadow Plant Materials Center Releases

'Vermilion' smooth cordgrass (*Spartina alterniflora*)

Brazoria seashore paspalum (*Paspalum vaginatum*)

Pelican black mangrove (*Avicennia germinans*)

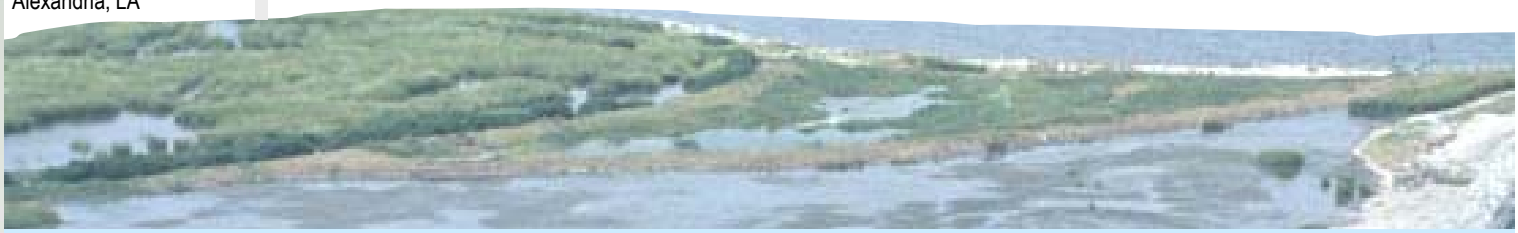
Fourchon bitter panicum (*Panicum amarum*)

Caminada seaoats (*Uniola paniculata*)

'Gulf Coast' Marshhay Cordgrass (*Spartina patens*)

NRCS Natural Resources Conservation Service

Golden Meadow Plant Materials Center
438 Airport Road
Galliano, Louisiana 70354



We develop and transfer plant materials and plant technology for the conservation of natural resources. In working with a broad range of plant species, including grasses, forbs, trees, and shrubs, the program seeks to address priority needs of field offices and land managers in both public and private sectors. Emphasis is focused on using native plants as a sustainable way to solve conservation problems and protect ecosystems.

If you would like more information call us at (985) 475-5280 or visit our web site at http://Plant-Materials.nrcs.usda.gov

An Accelerated Program of Woody Plant Species Selection for Conservation, Restoration, and Neotropical Habitat Enhancement

Initiated: 2001 **Status**: Active

Cooperators: Barataria-Terrebonne National Estuary Program Louisiana Universities, Marine Consortium and Greater Lafourche Port Commission

The PMC began an initiative to identify native woody plant species suitable for coastal restoration and remediation activities. The overall goal is to implement a program to develop woody plant species technology; to provide plant species information to coastal wetland managers; and to demonstrate methods for improving plant species diversity and improve wildlife habitat.

Seeds of ten species identified by the Barataria-Terrebonne Estuary Program Action Plan Committee have been collected from native populations found growing in coastal Louisiana. Germination requirements have been investigated and germinated seeds transplanted to containers for grow out. The species were planted to determine adaptation and performance on a barrier island, dedicated sediment disposal site, brackish marsh, protected bay, and the Plant Materials Center.

Species selected for evaluation include: hackberry (*Celtis laevigata*), live oak (*Quercus virginiana*), wax myrtle (*Morella cerifera*), Hercules-club (*Zanthoxylum clava-herculis*), red mulberry (*Morus rubra*), yaupon (*Ilex vomitoria*), American beautyberry (*Callicarpa americana*), sweet acacia (*Acacia farnesiana*), honeylocust (*Gleditsia triacanthos*), and persimmon (*Diospyros virginiana*). Germination of yaupon seed is difficult and plant materials were not available at planting time. Roughleaf dogwood (*Cornus drummondii*) has been substituted in all field evaluation plantings. Jerusalem thorn (*Parkinsonia aculeate*) was added to all field plantings. Survival and plant performance varies among planting sites (Table 1).

Table 1. 2004 percent survival of woody species from 5 field evaluation plantings.

Scientific Name	Common Name	Trinity Island	Barataria Spoil Bank	Grand Isle	LUMCON	Port Fourchon
		----------% survival----------				
Celtis laevigata	hackberry	100	80	83	N/A*	100
Quercus virginiana	live oak	95	100	93	60	98
Morella cerifera	wax myrtle	40	0	41	0	89
Morus rubra	red mulberry	95	60	72	55	91
Zanthoxylum clava-herculis	Hercules-club	100	20	20	25	80
Lantana camera	lantana	85	0	7	N/A	47
Callicarpa americana	American beautyberry	50	0	7	N/A	87
Acacia farnesiana	sweet acacia	95	100	94	100	100
Gleditsia triacanthos	honeylocust	100	100	100	N/A	93
Diospyros virginiana	persimmon	55	20	93	N/A	93
Cornus drummondii	Roughleaf dogwood	25	0	40	N/A	N/A
Parkinsonia aculeate	Jerusalem thorn	100	100	94	90	100

*N/A Due to space limitation only five species were planted at LUMCON.

Evaluation of post-harvest sugarcane field residue for sand fence alternatives and sand dune formation and stabilization

Begin: 2003 **Status:** Active
Cooperators: USDA - Agriculture Research Service (ARS) Sugarcane Research Unit

Sand fences have proven to be an effective low-cost solution to creating and enhancing low profile dunes on coastal beaches. Sand dunes in turn support important herbaceous plant species. The objective of this project is to evaluate alternative methods to catch, accrete, and stabilize blowing sands using hay bales and beneficial plant materials. In cooperation with the ARS Sugarcane Research Unit, tests are being conducted using baled sugarcane post harvest field residue and bitter panicum (*Panicum amarum*) vegetative propagules to stabilize and enhance dune formation.

A local sugarcane farmer provided 60 square bales of field sugarcane residue. Bales were installed on Fourchon Beach, Lafourche Parish, Louisiana in a linear fashion creating a windbreak forty feet long by three feet high. Bitter panicum propagules were installed in rows along the front and back of the bales. Propagules consisted of tying bundles of five stems cut to four feet lengths with jute twine. Bundles were laid in shallow trenches and covered with sand. Accreting sand and new vegetative growth of bitter panicum was observed two weeks after installation of the trial. Preliminary efforts have proven successful, and additional testing will be conducted in 2005.

A Vegetative Model for Restoration, Conservation, and Habitat Enhancement on Beneficial-Use Dredge Sediments

Begin: 2002 **Status:** Active
Cooperators: LSU AgCenter, BTNEP, and Greater Lafourche Port Commission

The primary goal of this study is to develop baseline information on environmental parameters affecting the selection, establishment, and growth of plant species for dredge-restored sites. Objectives of the study are: 1) to initiate steps which reduce the time required for the establishment of productive plant communities on dredge materials; 2) to develop methods to re-vegetate and manage dredge materials that will support increased plant species-rich habitat than currently being realized; 3) to provide planners, designers and builders with management strategies that incorporate an ecological and environmental perspective into dredge-material engineering.

Various field plantings have been established in cooperation with the LSU AgCenter and the Greater Lafourche Port Commission on a 230 acre dredge-restored site at Port Fourchon, Lafourche Parish, Louisiana. Evaluation plantings have been established to study: 1) aerial seeding techniques for the establishment of smooth cordgrass (*Spartina alterniflora*), 2) vegetative establishment of black mangrove (*Avicennia germinans*) in relation to elevation, 3) planting and performance of selected tree and shrub species, 4) planting and evaluation of salt tolerant wheat strains as a potential cover crop, and 5) planting and evaluation of selected native plant materials for use on areas where vegetation has not colonized naturally. Areas that lie between tidal/wet soil and upper elevations are more difficult areas to get vegetation established.

Evaluation of selected erosion control materials for establishing vegetative blankets

Begin: 2003 **Status:** Active
Cooperators: Louisiana Department of Natural Resources

Information is needed for the development and testing of alternative techniques for establishing plant materials in critically eroding areas. Vegetative establishment using bareroot and container grown plant materials have been the most widely used methods of planting coastal wetland plants. However, these methods have had mixed results. The objective of this project is to test the ability to root selected plant materials in commercially available fiber erosion control mats forming a vegetative blanket that can be effectively transported, anchored, and established on eroding sites.

A preliminary trial consisted of planting seeds of smooth cordgrass (*Spartina alterniflora)* and vegetative sprigs of seashore paspalum (*Paspalum vaginatum)* into two types of fiber erosion control mats (biomats). Natural fiber mats of either coconut or wood were used in this trial. Three-feet by twelve-foot mats were placed in fiberglass trays and grown out in a greenhouse. Water was maintained in each tray to keep the biomats saturated. Rooted mats were transported to a field pond on the PMC for evaluation. The coconut fiber mats performed well throughout the test. Plants in the wood fiber mats did not form as well as in the coconut fiber mats. The wood fiber mats also did not hold up well in the prolonged wet conditions. While the coconut fiber mats were relatively easy to transport and set out in the field, the wood fiber mats were difficult to handle and essentially came apart when attempting to prepare for transporting to the field.

Smooth cordgrass growing in coconut mat.

Establishment and management techniques of *Spartina alterniflora* for improved seed production

Begin: 2000 **Status:** Active

Typically conservation plantings of smooth cordgrass (*Spartina alterniflora)* in coastal Louisiana have been accomplished with expensive and labor-intensive containerized or bareroot plant materials. A more efficient and economical method of establishing *S. alterniflora* especially for large-scale plantings would be by planting seed. The purpose of this study is to develop improved methods and technology for the establishment, management, and harvesting of *S. alterniflora* seed production fields.

Vegetative stems of *S. alterniflora* 'Vermilion' have been planted in a 1.4 acre constructed pond using a mechanical transplanter. A row culture is maintained on 40-inch centers. Management techniques are being tested to improve seed production. Fertilization, insect and weed control, and the annual removal of standing dead biomass is being evaluated for the benefits of stand health, longevity as a perennial crop, and seed production.

Evaluation of giant bulrush (*Schoenoplectus californicus*) for asexually propagated cultivar (2000)

Schoenoplectus californicus has proven effective as a wave barrier for shoreline protection and stabilization. This native freshwater emergent plant is also important for stabilizing and restoring disturbed or degraded wetland areas, and for wildlife food and cover. There is a need for a tested and proven cultivar for conservation use in coastal Louisiana. Native populations were identified and vegetative propagules collected throughout coastal Louisiana in 1999. Forty-nine collections have been vegetatively propagated and increased for performance plantings on and off the PMC. Field evaluation plantings have been planted in Cameron Parish, Jefferson Parish, and PMC. Plant performance documentation is being evaluated for a potential selected class vegetative release in 2005.

Evaluation of live oak (*Quercus virginiana*) for coastal habitats (1999)

Live oak is an important native tree species of coastal areas in south Louisiana. Coastal erosion and salt water intrusion have caused the decline and disappearance of many live oak populations. An assembly of acorns collected from native live oak trees found growing in coastal areas of the Gulf of Mexico and the Atlantic Coast began in 1999. Acorns were collected by NRCS employee from coastal areas of Georgia, South Carolina, Florida, Alabama, Mississippi, Louisiana, and Texas. Fifty seed collections were received and accessioned. Many of the seed packets were infested with a seed boring insect. Thirty-two of the collections produced suitable plant materials for testing. Replicated plantings have been established at the PMC and Grand Isle, Jefferson, Parish Louisiana.

Evaluation of sea oats (*Uniola paniculata*) for adaptation and use on coastal beaches and barrier islands of the north central Gulf of Mexico (2002)

Seed collections were made in the fall of 2001 by LSU AgCenter and NRCS in cooperation with North Carolina State University. Eighty-nine accessions were delivered to the PMC for grow out. Evaluation plantings have been established 1) Holly Beach, Cameron Parish, and 2) Long Beach, Hancock County, MS.

Evaluation of smooth cordgrass (*Spartina alterniflora)* from brown marsh sites (2000)

Louisiana experienced a browning and dying of coastal wetlands during the spring of 2000. The areas most affected were salt marshes and the browning appearance described was mainly attributed to the browning and death of *Spartina alterniflora*. The size and rapidity of the event has been deemed unprecedented and cause for concern. This provided an opportunity to investigate dieback areas to see if any surviving germplasm was present. The PMC in cooperation with the Louisiana Department of Natural Resources embarked on a venture to search for and sample surviving S. alterniflora plant materials found growing on the most severely impacted dieback areas.

Live remnants of *Spartina alterniflora* plant materials found surviving on twenty sites of identified brown marsh dieback areas were collected and increased for evaluation. Replicated planting were established on nine impacted sites and one dedicated dredge sediment site. Plant performance is being evaluated with a potential release in 2005.

Assembly and evaluation of coastal ecotypes of switchgrass (*Panicum virgatum*) (2002)

Panicum virgatum is an important native prairie species. This species is found on occasion growing in coastal marshes of Louisiana. Several ecotypes have been found growing in saline and brackish marshes mainly on ridges and at higher marsh elevations. Samples taken from specimen plants found in these areas are vegetatively increased for assembly, future evaluation and potential use in coastal conservation.

Assembly and evaluation of Saltgrass (*Distichlis spicata*) (2004)

Distichlis spicata is a native perennial low-growing grass that often forms dense colonies on slightly elevated saline and brackish marshes along the Louisiana coast. There is interest in this species for conservation plantings because of its salt tolerance, soil stabilizing characteristics, wildlife value, contribution to the detrital cycle, and conservation plant biodiversity. An assembly of Louisiana ecotypes was initiated in 2004. The assembly continues with twelve collection sites accessioned and vegetatively increased.

Louisiana Native Plant Initiative

There is a growing interest from public and private sectors to utilize locally adapted native plant materials for restoration and revegetation projects in Louisiana. On April 22, 2004 a Memorandum of Understanding (MOU) was signed to formalize a partnership to develop a comprehensive plant materials program to collect, increase and release locally adapted species of native grasses, forbs and legumes.

The MOU is with the NRCS Plant Materials Program, McNeese State University, USGS National Wetlands Research Center and Coastal Plain Conservancy. Native plants currently in production include: little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*), rattlesnake master (*Eryngium yuccifolium*), cluster bushmint (*Hyptis alata*), Texas coneflower (*Rudbeckia texana*), black wand root (*Pterocaulon virgatum*), and wooly rose mallow (*Hibiscus lasiocarpos*). There are also 62 other species under initial evaluation in a common garden.

Visiting Groups

- Mekong River Basin Alliance (Vietnam)
- Mississippi River Basin Alliance
- LACD Marsh Committee
- National Society of Landscape Architects
- Louisiana School of Agricultural Sciences
- Louisiana Wetland Workshop for Teachers
- Southern University Bayou and Academy Program
- Delgado College
- Jason Institute
- Barataria-Terrebonne National Estuary and EPA
- International Environmental Business Conference
- Louisiana 4-H Honors Students

Chief Bruce Knight Visits PMC

From left, State Conservationist Don Gohmert, PMC Manager Gary Fine and Chief Bruce Knight.